

New Fish Records from Hawaii: *Hime*, *Pikea*, and *Omobranchus*

DONALD W. STRASBURG¹

IN THEIR RECENT *Handbook of Hawaiian Fishes* Gosline and Brock (1960) record 584 species of fish from Hawaii, and point out that many more may be expected when depths greater than 100 ft are sampled extensively. About one new Hawaiian fish has been recorded each year since the Handbook's appearance, with most coming from deep water (Gosline, 1960: 28; Randall, 1961: 58; 1963: 432, 447; Strasburg, 1960: 395). The present paper documents two new Hawaiian records obtained by deep handlining, and confirms the presence of a shallow-water blenny hitherto known only under peculiar circumstances.

Thanks are due Mr. Kuni Sakamoto of Honolulu for donating the handlined specimens, Mr. Joseph Harada of the Bureau of Commercial Fisheries Biological Laboratory in Honolulu for contributing the blenny, Dr. William A. Gosline for the loan of specimens in the University of Hawaii collections, and Mr. Tamotsu Nakata of the Bureau of Commercial Fisheries Biological Laboratory in Honolulu for preparing Figure 1.

FAMILY AULOPIDAE

Figure 1 depicts the first recorded Hawaiian specimen of the Aulopidae, an immature female of *Hime japonicus* (Günther). This fish was taken by bottomfishing with a handline at a depth of 780 ft. It was captured on April 15, 1963 by Mr. Kuni Sakamoto of the M/V "Koun Maru" of Honolulu. The capture site lies between Lanai and Kahoolawe, islands near the center of the main Hawaiian group.

Counts made on this specimen are: D 16, A 10, P 11-11, V 9-9, C 9 + 1 + 9, lateral line scales 43-43, transverse scale rows at level of fourth dorsal ray $3\frac{1}{2} + 1 + 5\frac{1}{2}$, predorsal scales 13, branchiostegal rays 13, and gill rakers on

first arch $4 + 1 + 13$. Measurements (in mm) are: standard length 219, head length 65, snout length 17.5, greatest eye diameter 17.7, greatest depth of body 41.3, least depth of caudal peduncle 16.2, snout to dorsal origin (diagonal) 77, length of dorsal base 64, snout to anal origin (diagonal) 165, length of anal base 23, longest dorsal ray (third) 41, longest pectoral ray (third from top) 39, longest pelvic ray (fourth) 44.5, longest anal ray (third) 20, greatest dimension of adipose fin 6.8, and width of bony interorbital 11.

The teeth are arranged in villiform bands in both jaws and on the vomer and palatines. The outer teeth are shorter than the inner ones. The center of the tongue bears an elongate band of tiny villiform teeth which are too small to be seen by the unaided eye, but which can be easily felt by probing with a finger or a needle. There is a single nostril on each side, guarded anteriorly by a small flap of skin.

The fish was frozen after capture and was thawed and photographed three days later. Its life coloration was as follows, based on a 35-mm transparency and field notes: Upper sides brownish-red, with dark-brown saddles running to the midsides beneath the anterior part of the dorsal fin, the posterior part of the dorsal fin, the adipose fin, and just before the caudal base. Interspaces between these saddles streaked with yellow pigment above lateral line. Lower sides silvery-white, blotched irregularly with vermilion. Throat, breast, and belly white; ventral side of tail and gill membranes lemon. Top of head olive-brown, cheeks silvery with red blotches, snout and opercle olive-brown with red blotches, iris yellow. Dorsal fin gray with round vermilion spots arranged in four irregular diagonal rows, largest spots about size of pupil; anal fin pale lemon; lower lobe of caudal yellow, with upper and lower rays streaked with red; upper lobe of caudal gray, blotched irregularly with lemon and red; pelvics lemon with orange blotches; pectorals hyaline with five vermilion

¹ U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. Manuscript received August 12, 1964.

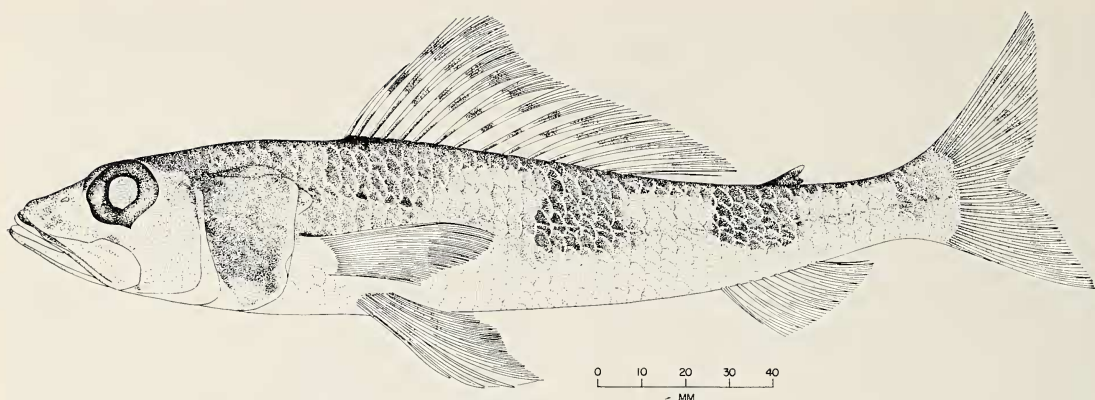


FIG. 1. Hawaiian *Hime japonicus* (Günther), 219 mm in standard length.

bands; adipose fin brown with red distal tip. This coloration agrees with that of the Japanese specimen figured by Kamohara (1955: pl. 9), except that his fish has only weak indications of spotting on the dorsal, caudal, and pectoral fins, and none at all on the cheeks and opercles.

In alcohol the Hawaiian *Hime* is dusky above and pale below. The four dark saddles persist, as does the gray ground color of the dorsal fin and upper caudal lobe. These fins are now white-spotted, for their vermilion pigment has faded completely.

The Hawaiian specimen agrees well with the description of the Japanese type given by Günther (1880:72) and with the brief account of other Japanese material presented by Matsubara (1955:240). *H. japonicus* can be distinguished from its only other congener, *H. damasi* (also from Japan), by its having 15 or 16 dorsal rays, about 43 lateral line scales, and an eye diameter about equal to the snout length, as compared with 14 dorsal rays, about 35 lateral line scales, and the eye diameter shorter than the snout in *damasi*. Among Hawaiian fishes *H. japonicus* superficially resembles the Synodontidae and the Chlorophthalmidae. It can be distinguished from the Synodontidae by its large eye, which is contained 3.6 times in the head length as opposed to 5–6 times in the Synodontidae, and from the Chlorophthalmidae by its long dorsal fin. The dorsal base is 3.5 times the eye diameter in *Hime*, and equals the eye diameter in *Chlorophthalmus*.

The specimen has been deposited in the U. S. National Museum (No. 198224).

FAMILY SERRANIDAE

A second unrecorded Hawaiian fish was taken with the *Hime* discussed above. This was a 214-mm male *Pikea maculata* Döderlein and Steindachner. Another unreported Hawaiian specimen of *P. maculata* was subsequently made available by Dr. Gosline. The latter fish, which is 213 mm in standard length, lacks collection data and its sex cannot be determined. Both specimens are essentially identical with Döderlein and Steindachner's illustration (Steindachner and Döderlein, 1883: pl. 6, fig. 1) of the Japanese type specimen, which is reproduced here as Figure 2.

Counts are the same for both specimens except for pectoral rays and scales. Both fish have D VIII, 12; A III, 8; VI, 5; C 17; branchiostegal rays 7; and gill rakers on the first arch 1 + 1 + 6 (there are also five flat patches of tiny denticles dorsad to the first raker and about four such patches ventrad to the last raker). The 214-mm fish has 68 pore-bearing scales in the lateral line, the 213-mm individual has 64. The 214-mm fish has $6\frac{1}{2} + 1 + 31$ scales transversely between the first dorsal spine and the anus, the 213-mm fish has $6\frac{1}{2} + 1 + 32$. The larger fish has a pectoral formula of i,14–i,14,i; the smaller has i,14,i in both pectorals. Schultz (1958:328) gives a pectoral formula of ii, 13 for Japanese *maculata*, but does not state the number of specimens examined or the range of variation in this character.

The teeth of *maculata* are needle-like and are closely set in bands on the dentary, premaxil-

lary, vomer, and palatines. They are retrorse and depressible posteriorly. The tongue bears tiny asperities which cannot be felt with the finger but which crepitate when probed with a needle. The anterior nostril lies in a simple thin-walled tube about 2.5 mm in length; the posterior nostril is kidney-shaped and has a raised rim.

Measurements (in mm) made on the 214- and 213-mm specimens, respectively, are: head length 82, 83; snout length 24.2, 23.0; eye diameter 14.4, 15.3; snout to dorsal origin (diagonal) 96, 91; length of dorsal base 85, 85; snout to anal origin (diagonal) 157, 155; length of anal base 31.4, 29.3; longest D spine (third) 24.0, 21.8; longest D ray (seventh) 43.5, 43.0; longest A spine (third) 21.3, 21.7; longest A ray (fourth) 40.7, 39.8; longest pectoral ray (fifth from top) 58.6, 54.8; longest pelvic ray (second) 37.4, 40.3; width of bony interorbital 17.1, 15.0; greatest depth of body 64, 64; and least depth of caudal peduncle 35.9, 34.7.

The 214-mm fish was frozen after capture, and thawed and photographed three days later. Its colors were as follows, based on a 35-mm transparency. Ground color pink; upper sides and back covered with numerous scattered red, dark-red, and yellow spots about size of pupil, yellow spots tending to form lengthwise stripes across snout and opercle. Lower sides, belly, and breast plain pink. Anal and spinous dorsal pink, the tips of the rays yellow; soft dorsal pink with dark-red spots and narrow yellow edge; pectorals light red, the upper rays yellow; outer caudal rays yellow, inner rays pink, spotted with dark-red. Iris red with traces of yellow.

In alcohol this fish is pale straw-colored except for what were formerly the dark-red spots on its upper sides, head, and caudal fin. These persist as brown spots. The longest dorsal, anal, pelvic, and caudal rays are narrowly tipped with black.

The two Hawaiian *maculata* fit the description and figure of the Japanese type specimen described by Steindachner and Döderlein (1883: 234), and also agree with *maculata* as set forth in the keys of Okada and Matsubara (1938:197–198) and Matsubara (1955:621). There are slight differences in proportions between Hawaiian and Japanese specimens in that the Hawaiian form tends to be slightly slimmer, its lateral line is highest beneath the fourth and fifth dorsal spines (instead of the sixth or seventh), and the last dorsal spine is only slightly less than half the length of the longest dorsal ray (rather than “much shorter” than half this ray).

P. maculata can be distinguished from *aurora*, the other Hawaiian *Pikea*, by the following characters. *P. maculata* has anal rays III, 8; 64–70 pores in the lateral line; 8 gill rakers on the first arch; and is marked anteriorly and posteriorly with spots about the size of the pupil. *P. aurora* has anal rays III, 9; 48–51 pores in the lateral line, 21 rakers on the first gill arch, and numerous tiny spots, the largest about $\frac{1}{3}$ pupil diameter in width, posteriorly on the body. Some of these data are from Schultz (1958:327) and from a specimen of *aurora* loaned by Dr. Gosline.

The 214-mm fish has been deposited in the U. S. National Museum (No. 198225).

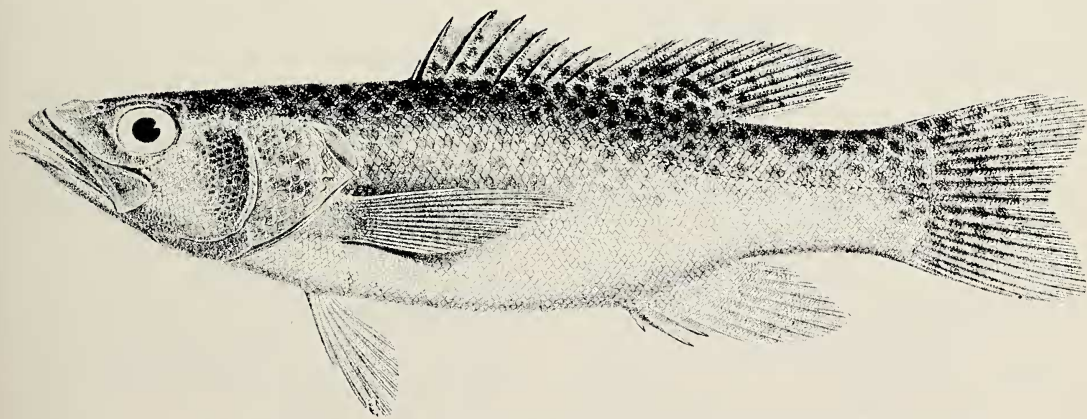


FIG. 2. Type of *Pikea maculata*, 25 cm total length. (After Steindachner and Döderlein.)

FAMILY BLENNIIDAE

Strasburg (1956:257) first recorded *Omobranchus elongatus* (Peters) from Hawaii on the basis of four specimens collected under peculiar circumstances. These fish were obtained from a concrete experimental tank located on Coconut Island, Kaneohe Bay, Oahu. The tank was supplied with running sea water, and at various times it housed experimental tunas, surgeonfish, exotic *Tridacna* clams, and other animals. The four *Omobranchus* were captured in the tank following draining; none have been taken since, in spite of years of intensive collecting in the Coconut Island area and elsewhere. It will probably never be determined how *Omobranchus* reached Hawaii, but the fact that one of the four original specimens was quite small suggested that it had been hatched in Hawaii, and that breeding populations therefore exist.

Mr. Joseph Harada, of the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, obtained a fifth Hawaiian specimen of *O. elongatus* on June 16, 1963. The fish emerged from a cavity in a lump of coralline rock when the rock was immersed in fresh water to clean it. The rock had been removed from a dead reef in Pearl Harbor, Oahu, at low tide two days earlier.

This newest Hawaiian *O. elongatus* agrees with the four specimens reported earlier. It is 56.3 mm in standard length, and is a male, judging from the ocellus in its soft dorsal. No gonad could be found. Counts made on it are D XII, 19; A II, 20; P 13-13; and number of pectoral rays encompassed by gill openings 6-6. It has a relatively short digestive tract for a blenny, and this was found to be packed with filamentous red, green, and blue-green algae along with large amounts of detrital matter and diatoms. Although *Omobranchus* has a prominent fang at the corner of each jaw, apparently it is a grazing herbivore. Perhaps the fangs aid in freeing algae from their attachments.

The capture of this specimen from an open reef in Pearl Harbor, on the opposite side of Oahu and 18 miles distant from Coconut Island, confirms the presence of native *O. elongatus* in Hawaii. Obviously its habitat has not been sampled very well. The specimen has been deposited in the U. S. National Museum (No. 198223).

REFERENCES

- GOSLINE, WILLIAM A. 1960. A new Hawaiian percoid fish, *Suttonia lineata*, with a discussion of its relationships and a definition of the family Grammistidae. *Pacific Sci.* 14(1): 28-38, 8 figs., 3 tables.
- and VERNON E. BROCK. 1960. Handbook of Hawaiian Fishes. University of Hawaii Press, Honolulu. ix + 372 pp., 4 col. pls., 277 figs.
- GÜNTHER, ALBERT. 1880. Report on the shore fishes procured during the voyage of HMS "Challenger" in the years 1873-1876. *Rept. Sci. Res. Voy. Challenger, Zool.* 1(6):1-82, 32 pls.
- KAMOHARA, TOSHIJI. 1955. Coloured Illustrations of the Fishes of Japan. [In Japanese.] Hoikusha, Osaka. xi + 135 pp., 64 col. pls., 76 figs.
- MATSUBARA, KIYOMATSU. 1955. Fish Morphology and Hierarchy, Part 1. [In Japanese.] Ishizaki-Shoten, Tokyo. xi + 789 pp., 289 figs.
- OKADA, YAICHIRO, and KIYOMATSU MATSUBARA. 1938. Keys to the Fishes and Fish-like Animals of Japan. [In Japanese.] Sanseido Co., Ltd., Tokyo and Osaka. xl + 584 pp., 113 pls.
- RANDALL, JOHN E. 1961. Two new butterflyfishes (family Chaetodontidae) of the Indo-Pacific genus *Forcipiger*. *Copeia* 1961(1): 53-62, 6 figs., 2 tables.
- 1963. Review of the hawkfishes (family Cirrhitidae). *Proc. U. S. Nat. Mus.* 114 (3472):389-451, 16 pls., 4 tables.
- SCHULTZ, LEONARD P. 1958. Three new seranid fishes, genus *Pikea*, from the western Atlantic. *Proc. U. S. Nat. Mus.* 108(3405): 321-329, 2 figs., 1 table.
- STEINDACHNER, FRANZ, and L. DÖDERLEIN. 1883. Beiträge zur Kenntniss der Fische Japans. [I.] *Denkschr. Akad. Wiss. Wien, Math.-nat. Kl.* 47(1):211-242, 7 pls.
- STRASBURG, DONALD W. 1956. Notes on the blennioid fishes of Hawaii with descriptions of two new species. *Pacific Sci.* 10(3):241-267, 4 figs., 5 tables.
- 1960. A new Hawaiian engraulid fish. *Pacific Sci.* 14(4):395-399, 2 figs., 2 tables.